

Waves (ch 14)

Define:

wave, an oscillation that transmits energy from one point to another.

physical waves - medium oscillates

Electromagnetic (EM) waves - waves of electric and magnetic fields (don't require a medium)

medium, the material the wave travels through

v , wavespeed, the distance travelled per unit time for the energy transfer. metres/second

λ wavelength, distance between successive peaks or troughs - metres

f or ν frequency, number of oscillations per unit time.

Hertz, Hz = cycle per second

T period, time for one oscillation, in s

amplitude, A , distance from the centre to the crest, related to the energy, $= A^2$

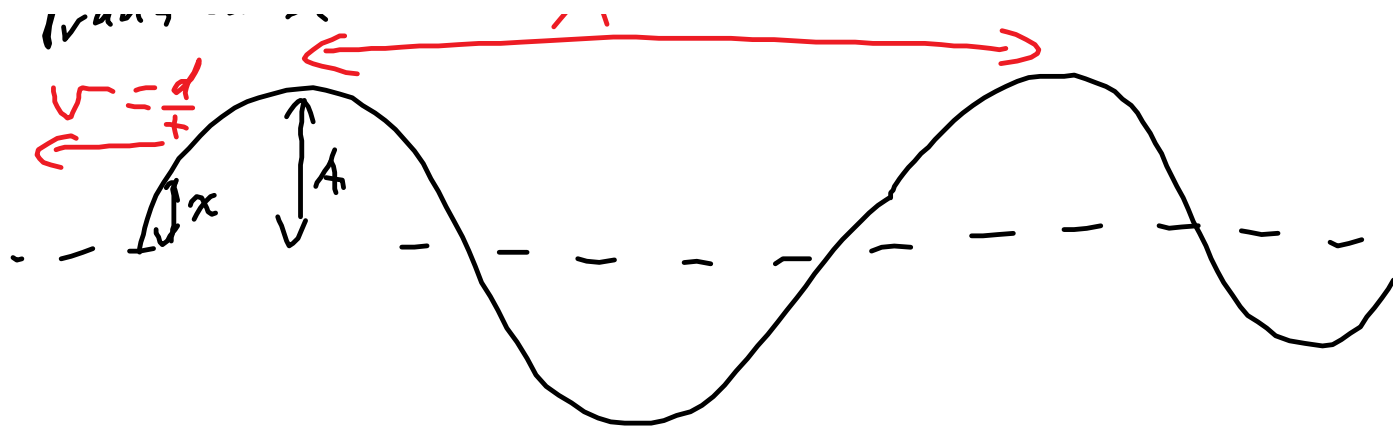
electromagnetic radiation, the energy = #photons x the energy of the photon $E=hf$

h = planck's constant $= 6.62 \times 10^{-34}$ Js

Intensity I = power/area in W/m^2

ϕ phase, the shift between two waves - how far one peak is behind the other, in Radians or in s or in m.





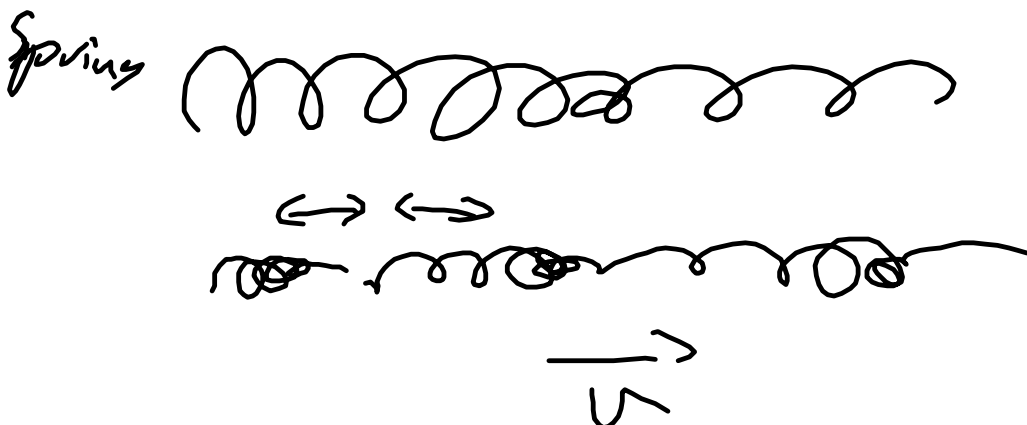
x is the displacement of the medium

$$x_{\max} = A = \underline{x_0} \text{ I B symbol}$$

→ displacement is perpendicular to energy transmission, v
 transverse

transverse waves eg. in strings, light - it can be polarized.

longitudinal, the displacement of the medium is in the direction of the energy transfer. eg. sound



surface, both transverse and longitudinal
 eg - earthquakes, ocean

interference,
reflection,
refraction,
diffraction

Write out a procedure for exploring the variables above using a slinky, metre stick and timing/video device (phone?)